

## CLAIMS

What is claimed is:

1           1.           A distributed ontology system comprising:  
2                       a central computer comprising a global ontology directory;  
3                       a plurality of ontology server computers, each comprising:  
4                               a repository of class and relation definitions;  
5           and  
6                       a server for responding to queries relating to  
7           class and relation definitions in said repository; and  
8                       a computer network connecting said central computer with said  
9           plurality of ontology server computers.

1           2.           The system of claim 1 wherein at least one relation definition  
2           within an ontology server computer references classes from a different ontology  
3           server computer.

1           3.           The system of claim 1 wherein said repositories also contain  
2           superclass and subclass relationships.

1           4.           The system of claim 3 wherein at least one superclass and  
2           subclass relationship resides on a different ontology server computer than the  
3           ontology server computer containing the subclass and the ontology server  
4           computer containing the superclass.

1           5.           The system of claim 1 wherein at least one of said plurality of  
2           server computers further comprise a publisher for publishing class and relation  
3           definitions in said repository to said global ontology directory.

1           6.           The system of claim 1 wherein said central computer further  
2           comprises an agent for seeking out class and relation definitions included in said  
3           repositories.

              The system of claim 1 further comprising an authoring tool for  
aid repositories.

1 8. The system of claim 7 wherein said authoring tool has the  
2 capability to browse repositories of a plurality of ontology server computers.

1 9. The system of claim 7 wherein said authoring tool comprises a  
2 validator for ensuring that updates made to said repositories maintain backward  
3 compatibility, so that expressions that are currently valid remain valid after the  
4 updates are made.

1 10. The system of claim 9 wherein said authoring tool further  
2 comprises a class adder for adding new class definitions to said repositories.

1 11. The system of claim 9 wherein said authoring tool further  
2 comprises a class editor for editing class definitions in said repositories.

1 12. The system of claim 9 wherein said authoring tool further  
2 comprises a relation adder for adding relation definitions to said repositories.

1 13. The system of claim 9 wherein said authoring tool further  
2 comprises a relation editor for editing relation definitions in said repositories, by  
3 expanding domains of relations.

1 14. The system of claim 1 further comprising a search engine for  
2 searching for class or relation definitions.

1 15. The system of claim 14 wherein said search engine resides on at  
2 least one of said plurality of ontology server computers.

1 16. The system of claim 14 wherein said search engine resides on  
2 said central computer.

1 17. The system of claim 14 further comprising an ontology toolkit  
2 comprising:  
3 a search tool, for searching said global ontology directory; and

4 a query tool for querying at least one of said plurality of  
5 repositories.

1 18. The system of claim 1 wherein the class and relation definitions  
2 in said repository include authorship data.

1 19. The system of claim 18 further comprising a web filter for  
2 generating a filtered ontology based on constraints on authorship data.

1 20. The system of claim 1 further comprising a text file embedder for  
2 embedding a text file having a description of a class within a repository.

1 21. The system of claim 1 further comprising an XML embedder for  
2 embedding an XML Schema within a designated repository by identifying class  
3 and relation definitions implicit in the XML Schema.

1 22. The system of claim 21 wherein said XML embedder identifies  
2 class and relation definitions with aid of a user choosing which classes and  
3 relations implicit in the XML Schema are to be included within the designated  
4 repository.

1 23. The system of claim 1 further comprising an XML embedder for  
2 embedding an XML Schema within a designated repository by converting the  
3 XML Schema into class and relation definitions.

1 24. The system of claim 23 wherein said XML embedder converts  
2 the XML Schema into class and relation definitions with aid of a user choosing  
3 which classes and relations implicit in the XML Schema are to be included within  
4 the designated repository.

1 25. The system of claim 1 further comprising a view generator for  
2 generating a view of a class by, by associating with the class a subset of attributes  
3 of the class.

1 26. The system of claim 25 wherein the subset of attributes of the  
2 class includes composed functions.

1 27. The system of claim 25 wherein at least one attribute in the  
2 subset of attributes is further associated with a view of the co-domain of the  
3 attribute.

1 28. The system of claim 25 further comprising an XML generator for  
2 generating a single XML Schema type element from the view.

1 29. The system of claim 25 further comprising an XML generator for  
2 generating an XML Schema from the view.

1 30. The system of claim 29 wherein said XML generator generates  
2 an XML Schema with aid of a user choosing which classes and relations are to be  
3 included within the XML Schema.

1 31. The system of claim 30 further comprising a class and relation  
2 navigation tool for guiding the user in choosing classes and relations.

1 32. The system of claim 25 further comprising a designator for  
2 designating classes and relations that are required and for designating classes and  
3 relations that are optional.

1 33. The system of claim 1 further comprising a graphical user  
2 interface including icons for displaying instances of classes.

1 34. The system of claim 33 further wherein said graphical user  
2 interface also includes icons for displaying sets of instances defined by a logical  
3 term.

1 35. The system of claim 1 further comprising an ontology navigation  
2 tool for viewing class and relation definitions.

1 36. An ontology system comprising:  
2 a repository of class and relation definitions;

3 a server for responding to queries relating to class and relation  
4 definitions in said repository; and

5 an XML embedder for embedding an XML Schema within said  
6 repository by identifying class and relation definitions implicit in the XML  
7 Schema.

1 37. The system of claim 36 wherein said XML embedder identifies  
2 class and relation definitions with aid of a user choosing which classes and  
3 relations implicit in the XML Schema are to be included within the repository.

1 38. An ontology system comprising:  
2 a repository of class and relation definitions;  
3 a server for responding to queries relating to class and relation  
4 definitions in said repository; and  
5 an XML embedder for embedding an XML Schema within said  
6 repository by converting the XML Schema into class and relation definitions.

1 39. The system of claim 38 wherein said XML embedder converts  
2 the XML Schema into class and relation definitions with aid of a user choosing  
3 which classes and relations implicit in the XML Schema are to be included within  
4 the repository.

1 40. An ontology system comprising:  
2 a repository of class and relation definitions;  
3 a server for responding to queries relating to class and relation  
4 definitions in said repository; and  
5 an XML generator for generating an XML Schema from class  
6 and relation definitions.

1 41. The system of claim 40 wherein said XML generator generates  
2 XML Schema with aid of a user choosing which classes and relations are to be  
3 included within the XML Schema.

1 42. The system of claim 41 further comprising an ontology  
2 navigation tool for guiding the user in choosing classes and relations.

1 43. The system of claim 40 wherein said XML generator converts at  
2 least a portion of a class and relation directed graph structure into a tree structure.

1 44. The system of claim 40 further comprising a designator for  
2 designating classes and relations that are required and for designating classes and  
3 relations that are optional.

1 45. The system of claim 40 wherein said XML generator comprises  
2 an XML embedder for embedding a pre-existing XML Schema within the  
3 generated XML Schema.

1 46. A distributed ontology method comprising:  
2 managing a plurality of repositories of class and relation  
3 definitions;  
4 managing a global ontology directory; and  
5 responding to queries relating to class and relation definitions in  
6 at least one repository.

1 47. The method of claim 46 wherein at least one relation definition  
2 within a repository references classes from a different repository.

1 48. The method of claim 47 wherein said repositories also contain  
2 superclass and subclass relationships.

1 49. The method of claim 48 wherein at least one superclass and  
2 subclass relationship resides in a different repository than the repository  
3 containing the subclass and the repository containing the superclass.

1 50. The method of claim 47 further comprising publishing class and  
2 relation definitions in at least one repository to the global ontology directory.

1 51. The method of claim 47 further comprising seeking out class and  
2 relation definitions included in the repositories.

1 52. The method of claim 47 further comprising updating the  
2 repositories.

1 53. The method of claim 52 further comprising browsing a plurality  
2 of repositories.

1 54. The method of claim 52 wherein said updating comprises  
2 validating that updates made to the repositories maintain backward compatibility,  
3 so that expressions that are currently valid remain valid after said updating is  
4 performed.

1 55. The method of claim 54 wherein said updating further comprises  
2 adding new class definitions to the repositories.

1 56. The method of claim 54 wherein said updating further comprises  
2 editing class definitions in the repositories.

1 57. The method of claim 54 wherein said updating tool further  
2 comprises adding relation definitions to the repositories.

1 58. The method of claim 54 wherein said updating further comprises  
2 editing relation definitions in the repositories, by expanding domains of relations.

1 59. The method of claim 47 further comprising searching for class or  
2 relation definitions.

1 60. The method of claim 59 further comprising:  
2 searching the global ontology directory; and  
3 querying at least one of the plurality of repositories.

1 61. The method of claim 47 wherein the class and relation  
2 definitions in the repositories include authorship data.

1 62. The method of claim 61 further comprising generating a filtered  
2 ontology based on constraints on authorship data.

1 63. The method of claim 47 further comprising embedding a text file  
2 having a description of a class within a repository.

1 64. The method of claim 47 further comprising embedding an XML  
2 Schema within a designated repository by identifying class and relation  
3 definitions implicit in the XML Schema.

1 65. The method of claim 64 wherein said identifying comprises user-  
2 aided choosing which classes and relations implicit in the XML Schema are to be  
3 included within the designated repository.

1 66. The method of claim 47 further comprising embedding an XML  
2 Schema within a designated repository by converting the XML Schema into class  
3 and relation definitions.

1 67. The method of claim 66 wherein said converting comprises user-  
2 aided choosing which classes and relations implicit in the XML Schema are to be  
3 included within the designated repository.

1 68. The method of claim 47 further comprising generating a view of  
2 a class by, by associating with the class a subset of attributes of the class.

1 69. The system of claim 68 wherein the subset of attributes of the  
2 class includes composed functions.

1 70. The system of claim 68 wherein at least one attribute in the  
2 subset of attributes is further associated with a view of the co-domain of the  
3 attribute.

1 71. The system of claim 68 further comprising generating a single  
2 XML Schema type element from the view.





1           81.           An ontology method comprising:  
2                       managing a repository of class and relation definitions;  
3                       responding to queries relating to class and relation definitions in  
4           the repository; and  
5                       embedding an XML Schema within the repository by converting  
6           the XML Schema into class and relation definitions.

1           82.           The method of claim 81 wherein said converting comprises user-  
2           aided choosing which classes and relations implicit in the XML Schema are to be  
3           included within the repository.

1           83.           An ontology method comprising:  
2                       managing a repository of class and relation definitions;  
3                       responding to queries relating to class and relation definitions in  
4           the repository; and  
5                       generating an XML Schema from class and relation definitions.

1           84.           The method of claim 83 wherein said generating comprises user-  
2           aided choosing which classes and relations are to be included within the XML  
3           Schema.

1           85.           The method of claim 84 further comprising navigating through  
2           class and relation definitions to guide said user-aided choosing.

1           86.           The method of claim 83 wherein said generating comprises  
2           converting at least a portion of a class and relation directed graph structure into a  
3           tree structure.

1           87.           The method of claim 83 further comprising designating classes  
2           and relations that are required, and designating classes and relations that are  
3           optional.

1           88.           The method of claim 83 wherein said generating comprises  
2           embedding a pre-existing XML Schema within the generated XML Schema.



1 98. The system of claim 97 wherein said authoring tool further  
2 comprises a class adder for adding new class definitions to said repositories.

1 99. The system of claim 97 wherein said authoring tool further  
2 comprises a class editor for editing class definitions in said repositories.

1 100. The system of claim 97 wherein said authoring tool further  
2 comprises a relation adder for adding relation definitions to said repositories.

1 101. The system of claim 97 wherein said authoring tool further  
2 comprises a relation editor for editing relation definitions in said repositories, by  
3 expanding domains of relations.

1 102. The system of claim 90 further comprising a search engine for  
2 searching for class or relation definitions.

1 103. The system of claim 102 further comprising an ontology toolkit  
2 comprising:  
3 a search tool, for searching said global ontology directory; and  
4 a query tool for querying at least one of said plurality of  
5 repositories.

1 104. The system of claim 90 wherein the class and relation definitions  
2 in said repository include authorship data.

1 105. The system of claim 104 further comprising a web filter for  
2 generating a filtered ontology based on constraints on authorship data.

1 106. The system of claim 90 further comprising a text file embedder  
2 for embedding a text file having a description of a class within a repository.

1 107. The system of claim 90 further comprising an XML embedder  
2 for embedding an XML Schema within a designated repository by identifying  
3 class and relation definitions implicit in the XML Schema.

1            109.            The system of claim 90 further comprising an XML embedder  
2            for embedding an XML Schema within a designated repository by converting the  
3            XML Schema into class and relation definitions.

1            110.            The system of claim 109 wherein said XML embedder converts  
2            the XML Schema into class and relation definitions with aid of a user choosing  
3            which classes and relations implicit in the XML Schema are to be included within  
4            the designated repository.

1        111.        The system of claim 90 further comprising a view generator for  
2        generating a tree of attributes from class and relation definitions.

1        112.        The system of claim 111 wherein said view generator is an XML  
2        generator for generating an XML Schema from class and relation definitions.

1            113.            The system of claim 112 wherein said XML generator generates  
2            an XML Schema with aid of a user choosing which classes and relations are to be  
3            included within the XML Schema.

1        114.        The system of claim 113 further comprising a class and relation  
2        navigation tool for guiding the user in choosing classes and relations.

1            115.            The system of claim 111 further comprising a designator for  
2            designating classes and relations that are required, and for designating classes and  
3            relations that are optional.

1        116.        The system of claim 90 further comprising a graphical user  
2        interface including icons for displaying instances of classes.

1 117. The system of claim 116 further wherein said graphical user  
2 interface also includes icons for displaying sets of instances defined by a logical  
3 term.

1 118. The system of claim 90 further comprising an ontology  
2 navigation tool for viewing class and relation definitions.

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